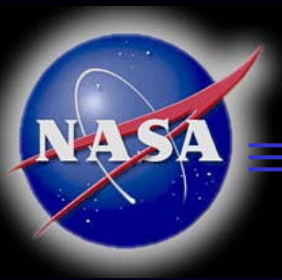




Standard Transport and Network Capabilities

June 5, 2003

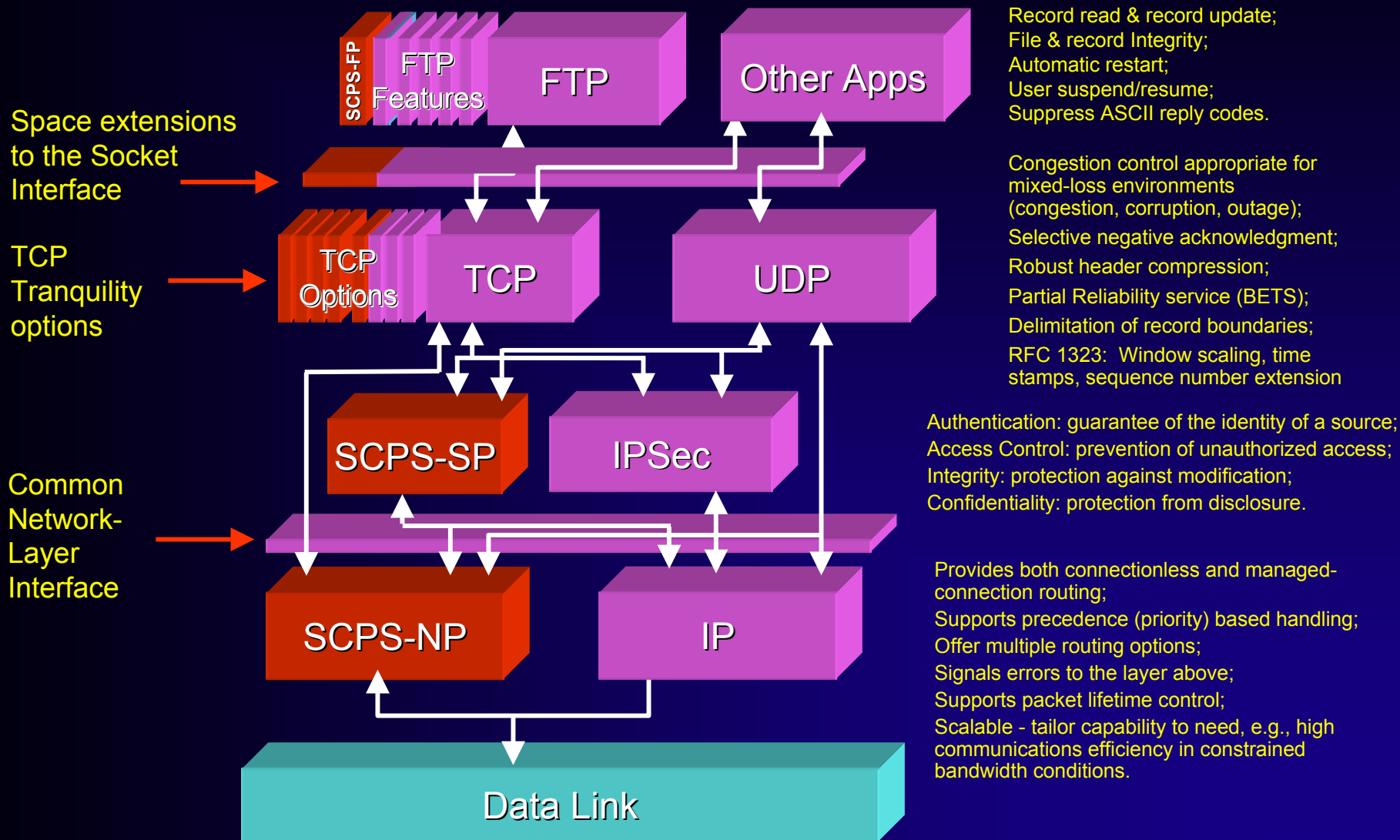
Robert C. Durst
The MITRE Corporation
+1 703 883-7535
durst@mitre.org



AGENDA

- ◆ **CCSDS Space Internet Protocol Options**
- ◆ **Architectural Alternatives for End-to-End Data Transfer**
- ◆ **Distribution and Product Information**

Current CCSDS Space Internet Protocol Options



The CCSDS protocol suite supports either "native" or "space enhanced" Internet services, at the discretion of the Project organization



• NASA DATA SYSTEM STANDARDS PROGRAM •

Documents Index Page - Netscape

File Edit View Go Bookmarks Tools Window Help

http://nasa.usainfo.com/prog/NDocBrf.asp


Home Search Bookmarks

Main Menu | Feedback | Doc Locator Service | Log Out | Back to Search |

Back To Search

Number of Documents Found: 4 Documents Index Display Page: 1 of 1


Document No.	Rev.	Date [Base] (latest change)	Title	Doc Status	No. of Pages	No. of NASA Accesses Since 06/2001	NASA Status	LL/BP & AN	SDO
CCSDS-713.0-B <i>Base</i>	1	05/01/1999	SPACE COMMUNICATION PROTOCOL SPECIFICATION (SCPS) NETWORK PROTOCOL	Active	110	0	Preferred		CCSDS
CCSDS-713.5-B <i>Base</i>	1	05/01/1999	SPACE COMMUNICATION PROTOCOL SPECIFICATION (SCPS)- SECURITY PROTOCOL	Active	52	0	Preferred		CCSDS
CCSDS-714.0-B <i>Base</i>	1	05/01/1999	SPACE COMMUNICATION PROTOCOL SPECIFICATION (SCPS) - TRANSPORT PROTOCOL	Active	111	0	Preferred		CCSDS
CCSDS-717.0-B <i>Base</i>	1	05/01/1999	SPACE COMMUNICATION PROTOCOL SPECIFICATION (SCPS) - FILE PROTOCOL	Active	81	0	Preferred		CCSDS


 **NASA**
Technical Standards Program

Overview Feedback Tutorial Help FAQ Disclaimer

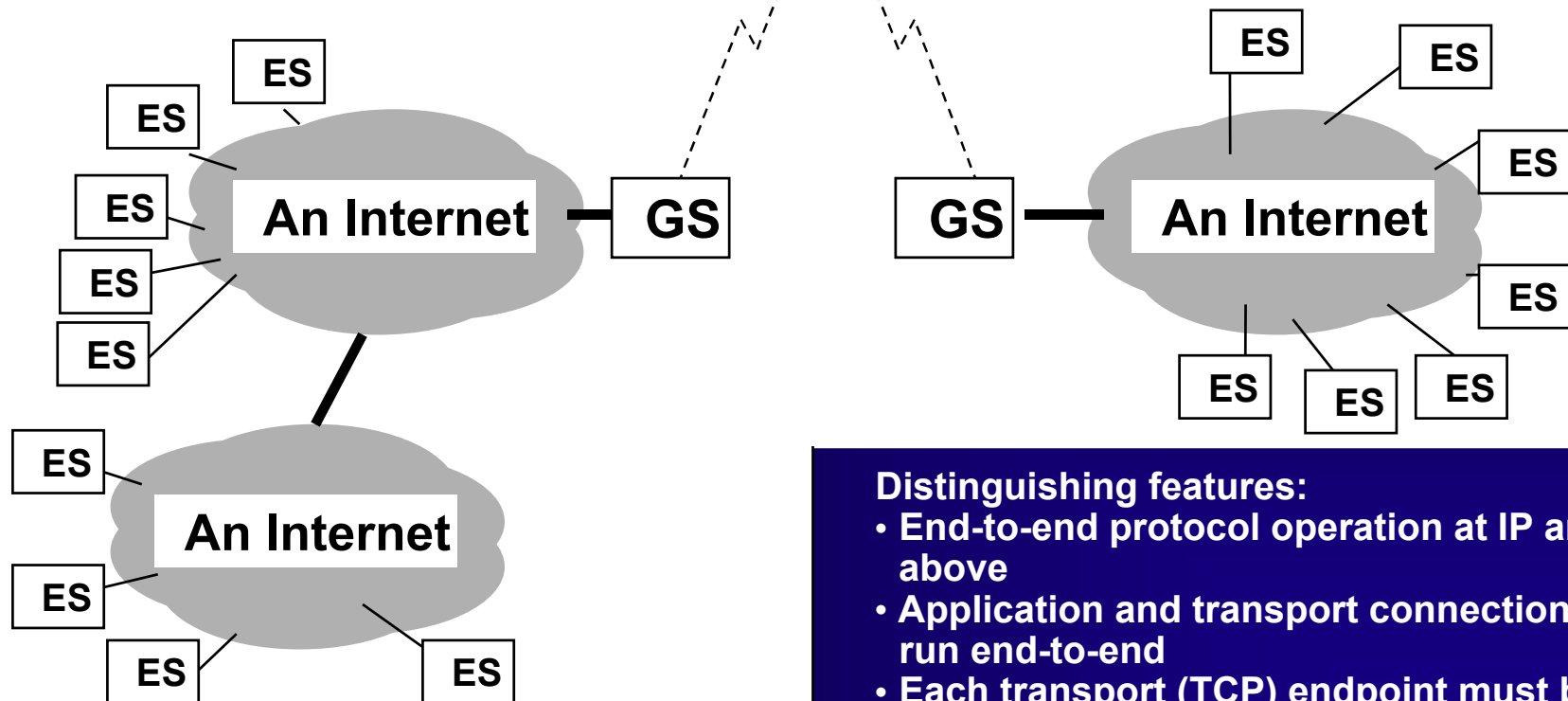
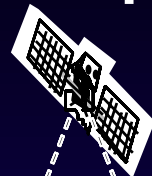
NASA ACCESS (Registration/Logon) What's New

- Agencywide Full-Text Technical Standards System (Access To NASA Preferred & Other Technical Standards Products)
- Standards Update Notification System (SUNS)
- NASA Technical Standards Management System
- NASA Participation In Committees & Working Groups
- Standards Developing Organizations
- Lessons Learned / Best Practices

Powered By 



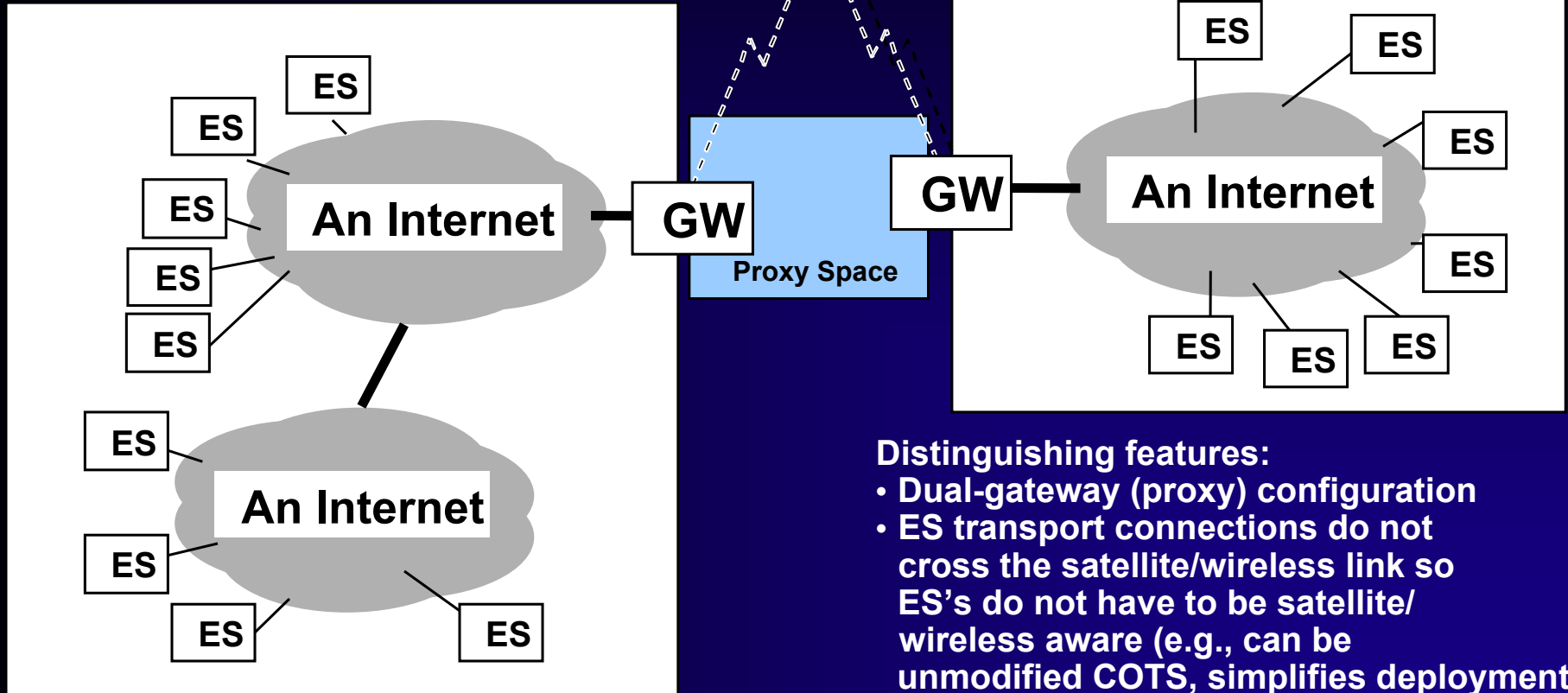
Architectural Alternative: End-to-End Operation



Distinguishing features:

- End-to-end protocol operation at IP and above
- Application and transport connections run end-to-end
- Each transport (TCP) endpoint must be tuned to maximize performance/utilization over satellite link
- Tunings for satellite link may be inappropriate for terrestrial links

Architectural Alternative: Proxy-Based Operation



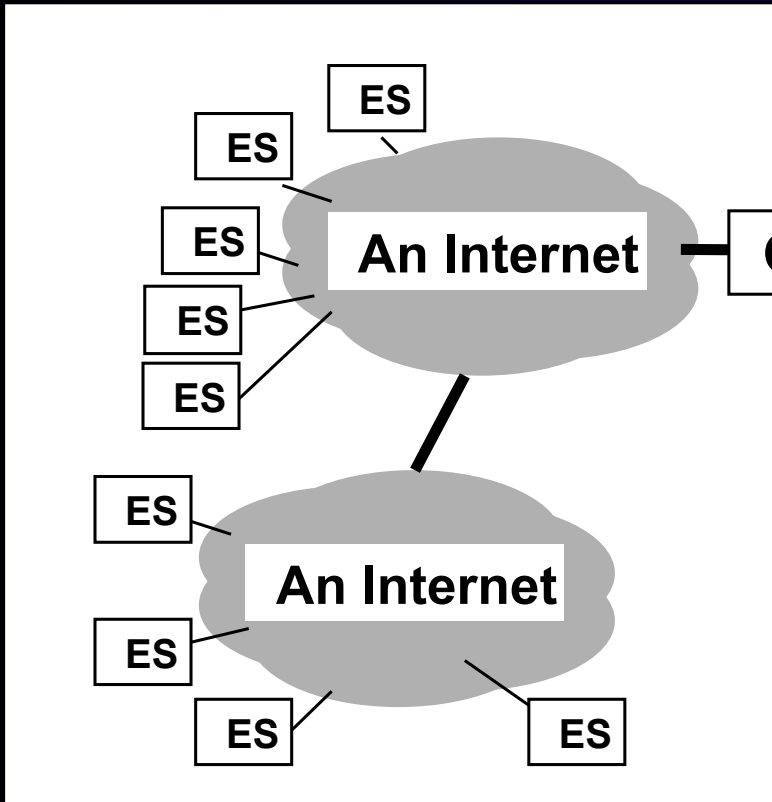
ES = End System

GW = Transport Layer Gateway (Proxy)

Distinguishing features:

- Dual-gateway (proxy) configuration
- ES transport connections do not cross the satellite/wireless link so ES's do not have to be satellite/wireless aware (e.g., can be unmodified COTS, simplifies deployment)
- Application layer connections run end-to-end
- Security above transport or via trusted gateways

Architectural Alternative: Hybrid Proxy Operation

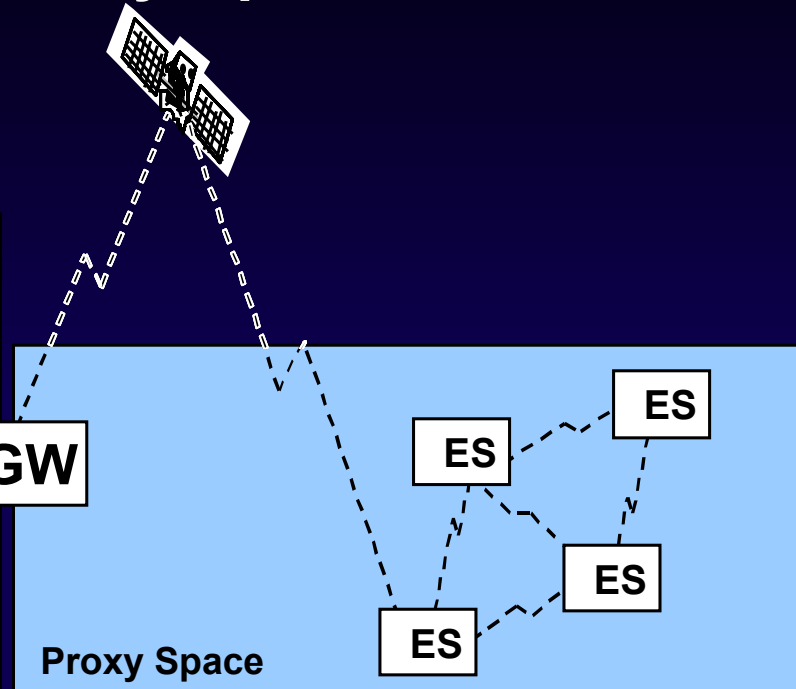


ES = End System

GW = Transport Layer Gateway (Proxy)

Third Space Internet Workshop

NASA/GRC



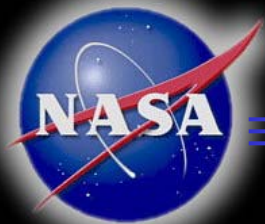
Distinguishing features:

- Single proxy gateway configuration
- ES connections on spacecraft/
wireless side traverse the satellite
hop - ES's must be satellite aware
- Wireless ES-to-ES communication
via satellite possible without GW's
- Suitable for constellations or onboard
use



Distribution and Product Information

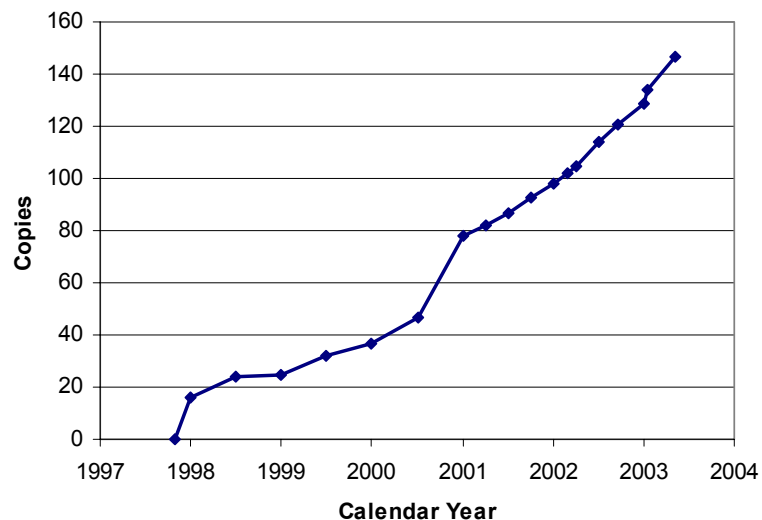
- ◆ **Reference Implementation of CCSDS Space Internet Protocol Options is freely available (ref. www.scps.org)**
- ◆ **Two fully-independent implementations of the transport layer capability have completed successful interoperability testing**
- ◆ **In-kernel network and transport layer protocols available for NetBSD, many transport layer gateway products available**



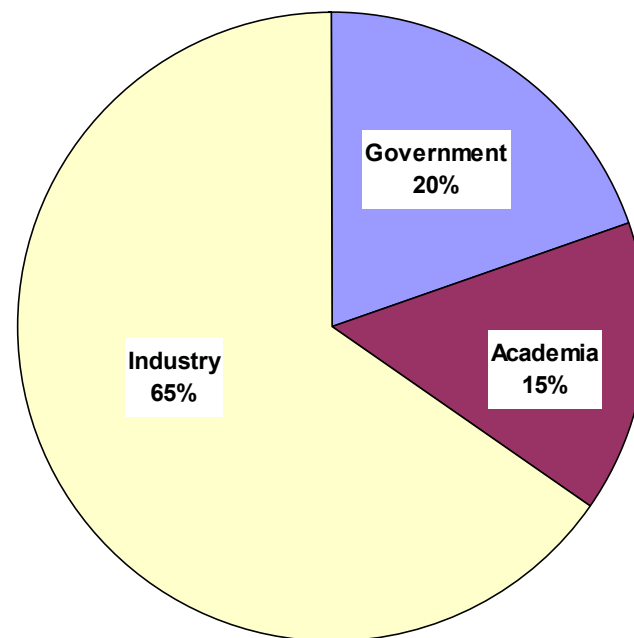
• NASA DATA SYSTEM STANDARDS PROGRAM •

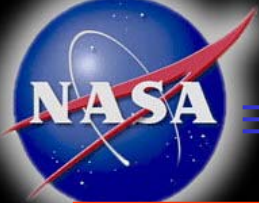
SCPS Reference Software

SCPS RI Distribution by Date

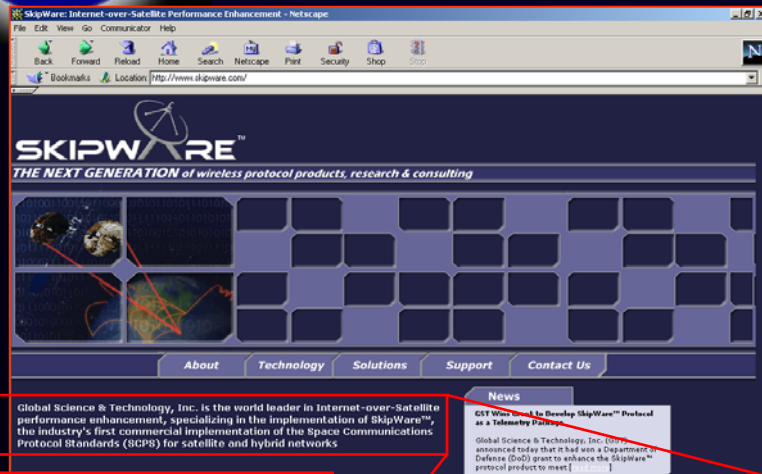


SCPS RI Distribution by Sector





• NASA DATA SYSTEM STANDARDS PROGRAM •



XipLink 10Mbps Gateways

Accelerated Internet over Satellite in a box.

XipLink Gateways are 1U hardware units that makes the most of your bandwidth in stressed communications environments.

The XipLink Gateway includes all of the features of our XipLink technology for optimized TCP/IP over satellite, including:

- Fast Start Technology
- Header Compression
- Rate Control Options
- Faster retransmissions

XipLink Gateways are protocol gateways (also known as performance enhancing proxies) implementing an open, internationally recognized standard. Compatibility with existing TCP/IP systems makes deployment easy. They are highly configurable and customizable, remotely manageable and can be deployed in point to point or multipoint topologies. XipLink technology such as fast start, allowing you to fetch a web object in a single round trip time, makes the difference in closing the performance gap with terrestrial networking.



**XipLink
SCPS-TP**

IP communications through stressed links
TCP compatibility for high latency, high BER, or high asymmetry

HotLens Bandwidth TurboBooster™

HotLens Bandwidth TurboBooster™ let you enjoy high speed Internet access through long-haul terrestrial, wireless and satellite networks. It implements the latest NASA and DOD SCPS TCP acceleration as well as data compression technology to deliver 5 – 30 times faster data transfer depending on network latency, packet loss and compression.

HotLens Bandwidth TurboBooster™ offers:

1. **High Speed Internet Access:** You can provide 5 – 30 times faster Internet access to wireless and satellite users.
2. **Accelerated Applications Delivery:** You can deliver mission critical corporate applications much faster to remote offices.
3. **Expanded Network Capacity:** Your network capacity effectively expands because of the efficient network data compression.
4. **Scalable Deployment:** You can deploy the technology incrementally because it is fully backward compatible with existing TCP network traffic.

Features

- High Speed Internet Access
- Accelerated Applications Delivery
- Expanded Network Capacity
- Scalable Deployment

HotLens

Empire State Building
350 Fifth Ave., Suite 5804
New York, NY 10118

Tel: (212) 465 1700
Email: sales@hotlens.com
Web: http://www.hotlens.com

Global Science & Technology, Inc. is the world leader in Internet-over-Satellite performance enhancement, specializing in the implementation of SkipWare™, the industry's first commercial implementation of the Space Communications Protocol Standards (SCPS) for satellite and hybrid networks

packet loss. It implements the latest NASA and DOD SCPS TCP acceleration as well as data compression technology to deliver 5 – 30 times faster data transfer depending on

In a network, each Q4 can communicate one-on-one with specific ground segment terminals using SCPS-NP, or with other onboard Q4s using high-speed SpaceWire.





• NASA DATA SYSTEM STANDARDS PROGRAM •

1. Interplanetary Internet: An Architectural Framework for Space Internetworking: Adrian Hooke
2. User Data Services for Internet Based Spacecraft Applications: Joe Smith
3. CCSDS File Delivery Protocol (CFDP): Tim Ray
4. Internet Protocol Based Standards for Spacecraft Onboard Interfaces: Joe Smith
5. Standard Spacecraft Interfaces and IP Network Architectures: Jane Marquart
6. Standard Transport and Network Capabilities: Bob Durst
7. Next Generation Space Internet: Standards and Implementation: Keith Scott
8. Secure Space Networking: Howie Weiss
9. Delay Tolerant Networking: Scott Burleigh
10. CCSDS Link Layer Protocol Suite: Greg Kazz

